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Geographic Knowledge**

Division of Information Technology Services
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January 13, 2005

Overnight Mail Deliveries:
Ms. Rebecca Moser
Exchange Network Grant Program Manager
U.S. Environmental Protection Agency
Office of Environmental Information
Office of Information Collection
1301 Constitution Avenue, NW, 6th Floor, #6143-K
Washington, DC   20460

Subject: FY 2005 Environmental Information Exchange Network Grant Program Implementation
Category Application Package

Dear Ms. Moser,

The Utah Automated Geographic Reference Center (AGRC) respectfully submits this application package, plus two copies, for an Implementation Category Grant under the Fiscal Year (FY) 2005 Environmental Information Exchange Network Grant Program for the project entitled **Utah Underground Injection Control (UIC) Program Geospatial Data Integration Project.**

AGRC proposes this project to apply the technical expertise of AGRC staff towards the development of a powerful geospatial data integration toolset to meet the challenging business drivers of the Utah Underground Injection Control (UIC) Program, which is a federal environmental program administered by the Utah Department of Environmental Quality (DEQ).   AGRC is a recognized leader in the implementation of statewide enterprise GIS technology and has extensive experience in GIS database design and the development of geospatial internet applications. We feel this project is an excellent fit, both for our skill set and our agency's mission, and look forward to working with the EPA and our project partners to see this plan to fruitition.

The proposed effort will model geospatial data exchange and integration utilizing technology and standards established through the Exchange Network initiative and demostrate the value of utilizing this framework for making environmental regulatory decisions. UIC Program challenges are presented by the need to integrate and evaluate data from various environmental programs and business sectors in the most efficient way possible. This tool will facilitate the Utah UIC Program, which consists of one full time employee, in prioritizing its activities (i.e., inventory, inspection, permitting, and closure) for minimizing public health-based impacts from UIC-regulated facilities.
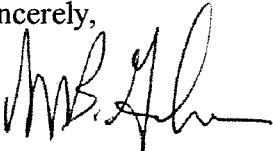
David Fletcher	Dennis Goreham	Ken Elliott
Director	*AGRC Manager*	*Deputy Director*

Thank you in advance for your consideration of this proposal. We look forward to the many opportunities and advancements that this project will present to the State of Utah and its citizens.

Sincerely,

Dennis Goreham
AGRC Manager

General application information follows:

Name of the Applicant's Organization: Utah Automated Geographic Reference Center (AGRC)

DUNS Number: 94-839-2360

Name of the Project Manager(s): Dennis Goreham / Bert Granberg

Category of Grant Requested: Implementation

Amount of Funding Requested: $300,000

Formal Project Partners: Utah Automated Geographic Reference Center (AGRC) and Utah Department of Environmental Quality (DEQ) (Office of Information Technology (DEQ/IT) and Division of Water Quality (DWQ) - Underground Injection Control (UIC) Program (DEQ/DWQ/UIC))

Coordination between IT/IM Offices and Environmental Media Programs:
Success of this project will depend to a great degree on the coordination and cooperation between AGRC; the various agencies and programs within DEQ, particularly DEQ/IT and DEQ/DWQ/UIC; and other originators of various data layers to be integrated into the end product. A Memorandum of Understanding (MOU) between the major cooperating entities will serve to ensure the success of the proposed efforts of the project. Details of the elements of coordination/cooperation are given in Part 1g of the Work Plan. The MOU is included in the application package.

Preferred Assistance Vehicle: Grant

Desired Amount and Form of Funding: Direct Funding for $300,000

Would the applicant like the award to be incorporated into a PPG or a CG)? No

January 13, 2005

Ms. Rebecca Moser
Exchange Network Grant Program Manager
U.S. Environmental Protection Agency
Office of Environmental Information
Office of Information Collection
1301 Constitution Avenue, NW, 6th Floor, #6143-K
Washington, DC   20460

Dear Ms. Moser:

Subject: Utah Department of Environmental Quality, Executive Director Approval of the Environmental Information Exchange Network (EIEN) Grant Program Implementation Category Application for the project entitled **Utah Underground Injection Control (UIC) Program Geospatial Data Integration Project.**

The Utah Department of Environmental Quality (DEQ) looks forward to working with the Utah Automated Geographic Reference Center (AGRC) during the development of a geospatial data integration tool under the subject grant project. Through its newly certified fully operational Network Node, DEQ will continue its involvement in the Environmental Information Exchange Network Program by the development of information management/information technology tools such as those proposed in the subject project. Additionally, not only will this project address the administrative needs of the Utah Underground Injection Control Program, it will enhance the ability of multiple agencies, and divisions within those agencies to more easily share relevant data sets, allowing for more informed environmental decisions.

I enthusiastically support this project and encourage the US EPA to give it full consideration in the grant application review process.

Since AGRC is the applicant agency for this project, the required cover letter information is included in that agency's cover letter accompanying the application package.

Best regards,

Dianne R. Nielson, Ph.D.
Executive Director

Utah Underground Injection Control (UIC)
Program Geospatial Data Integration Project.

Work Plan

1. General Project Information
a. **FISCAL YEAR**: FY 2005   **GRANT CATEGORY**: Implementation
b. **TOTAL AMOUNT OF FUNDING REQUESTED**: $300,000
c. **NAME OF THE APPLICANT ORGANIZATION**: Utah Automated Geographic Reference Center (AGRC)
d. **DUNS NUMBER**: 94-839-2360
e. **NAME OF THE PROJECT MANAGER(S) AND CONTACT INFORMATION**: Dennis Goreham; Manager, AGRC; MAILING ADDRESS: State Office Building, Room 5130; Salt Lake City, UT 84114; PHONE: 801-538-3163; FAX: 801 538-3317; EMAIL: dgoreham@utah.gov

   Bert Granberg; GIS Solutions Specialist; AGRC; MAILING ADDRESS: State Office Building, Room 5130; Salt Lake City, UT 84114; PHONE: 801-538-3072; FAX: 801 538-3317; EMAIL: bgranberg@utah.gov
f. **FORMAL PROJECT PARTNERS, THEIR ROLES AND RESPONSIBILITIES, AND FUNDS DISTRIBUTION**:
   Dennis Goreham; Manager AGRC
   Roles and Responsibilities:
   Mr. Goreham will serve as the formal project contact and will handle executive-level administration for the grant and will be the financial manager of this grant on behalf of AGRC. Mr. Goreham will be the contact for the EPA Region 8 Coordinator for the Exchange Network Program.

   Bert Granberg; GIS Solutions Specialist, AGRC
   Roles and Responsibilities:
   Mr. Granberg will serve as project and technical manager and for the implementation of the proposed project work plan. Mr. Granberg will also facilitate the pre-implementation planning and coordination efforts and will be responsible for fulfilling all grant reporting requirements.

   Ryan Walker, Director of Information Technology (IT), Utah Department of Environmental Quality (DEQ)
   Roles and Responsibilities:
   Mr. Walker will work closely with AGRC during the migration of the current Sybase database data into the newly developed geodatabase. Mr. Walker will also coordinate with AGRC where elements of the proposed project require data flow through the Exchange Network Node administered by DEQ/IT.

   Candace C. Cady, P.G.; Environmental Scientist, UIC Program Coordinator, DEQ, Division of Water Quality (DWQ)
   Roles and Responsibilities:

Ms. Cady will work closely with AGRC in communicating the UIC Program database data element requirements during the development of the geodatabase. She will also coordinate between AGRC and other environmental agencies, both within and outside DEQ, for the acquisition and integration of various data layers into the UIC ArcGIS application. Candace will work closely with the DWQ GIS Specialist who will also be involved in the daily use of the resulting product. The DWQ Groundwater Section Records Specialist will also be involved in entering the backlogged inventory information data once the geodatabase is complete.

Funds Distribution:
All project funds will be distributed to AGRC. AGRC will initiate an MOU with UIC to include a provision for inter-agency funds transfer to cover salary and benefits of UIC staff covered by this project. Computer equipment and software licenses (purchased using the DEQ ESRI customer ID number) will be transferred to DEQ/UIC upon initial receipt and configuration. Training and training related travel expenses for DEQ staff will be paid for from the grant through AGRC.

g. **COORDINATION BETWEEN IT/IM OFFICES AND ENVIRONMENTAL MEDIA PROGRAMS:**
AGRC, DEQ/IT, and EPA/HQ/National UIC Database Development personnel will coordinate to ensure successful data flow from the UIC database through the DEQ Exchange Network Node to the developing National UIC Database. Carl Reeverts has agreed to be the EPA HQ contact person for this element of the project. AGRC will coordinate with DEQ/IT for the acquisition of EPA RCRAInfo and SDWIS through the DEQ Exchange Network Node. Although the EPA Source Water Protection (SWP) data system is still in development status and the currently digitized groundwater-based Source Water Protection Zone polygons (SWPZs) are available directly from DEQ Division of Drinking Water (DDW) SWP Program, AGRC will communicate with National SWP Database Development personnel to ensure the ability to pull data from that database through the DEQ Exchange Network Node once the SWP database is in production status. AGRC will also provide ongoing technical support and training to the UIC Program coordinator and the DWQ GIS Specialist.

The Utah UIC Program will coordinate with AGRC to communicate data elements needs of the UIC Program. The UIC Program will coordinate with the SWP Program and AGRC in prioritizing the digitization of groundwater-based SWPZs. The UIC Program will also coordinate the integration of data layers from other non-national data systems such as those available from DEQ Division of Environmental Response and Remediation (DERR) (LUST, UST, Site Remediation coverage), Department of Natural Resources (DNR), Division of Oil, Gas, and Mining (DOGM) (Oil & Gas, and UIC Class II wells), and DNR Division of Water Rights (DWRights) (water wells > 30 feet deep)

The Utah Office of the Chief Information Officer supports this project which furthers Utah's strategic goal to deliver integrated enterprise information systems and infrastructure.

h. **PREFERRED ASSISTANCE VEHICLE:** Grant

i. **PREFERRED FORM OF FUNDING:** Direct Funding

2. **Project Purpose, Goals, Milestones, and Expected Benefits**
   The purpose of this project is to develop, populate, and maintain a highly accessible, standards-based geospatial database server and information system to both store Utah Underground Injection Control (UIC) program data and to integrate UIC data with other environmental and framework geospatial data layers. These efforts will model geospatial data exchange and demonstrate the value of data integration in making environmental regulatory decisions that benefit both Utah's environment and its citizens'quality of life.

   This effort, to be undertaken by The Utah Automated Geographic Reference Center (AGRC) in cooperation with the Utah UIC Program, will facilitate the fulfillment of the UIC business needs, including: UIC data collection, assessment, and distribution; optimization of human health related impacts by employing geospatial analysis to prioritize UIC Program activities (i.e., inventory, inspection, permitting, and closure) near SWPZs; provision of UIC data layers to other agencies; and preparation of periodic reports to the EPA. Our intent is to develop a geospatial application that is central, even essential, to the effective administration of the Utah UIC Program. We expect that, in attaining the project's established goals, to provide multiple ancillary benefits to DEQ agencies, partnering organizations, and, agencies within other jurisdictions that are interested in integrating geospatial databases with the National Environmental Information Exchange Network.

   Given EPA's commitment to develop a geospatial program as indicated in *EPA Geospatial Blueprint: A Strategic Plan for EPA's Geospatial Program*, this project would serve as a state model demonstrating the benefits of acquiring and integrating geospatial data layers from several sources to enhance the environmental decision-making process.

   AGRC was established by the State of Utah to be the principal GIS and geospatial coordination agency for Utah. AGRC exists to coordinate, facilitate, and provide technical assistance to state and local GIS efforts and to maintain the State Geographic Information Database (SGID) – an statewide, enterprise-wide GIS library with over 200 data layers available for download and through direct database connection. An extensive system of infrastructure and expertise has been developed to support the GIS services that AGRC provides. AGRC has a strong track record as a leader in the GIS field and continues to work with federal, regional, state, tribal, and local entities to enhance and expand the contents of the SGID, document the files using national metadata standards, and develop innovative and effective ways to distribute the data.

   As the lead agency for this project, AGRC brings extensive geospatial database design and administration, GIS application development, and XML-based web services experience that will be required for the success of this project. In addition, this project is consistent with AGRC's legislative mandate to further the implementation of GIS technologies within Utah government.

PROJECT GOALS:
Several goals have been identified for achieving the overall purpose of the project. These goals and their associated benefits are detailed below. *Table 1*, which details each goal, associated tasks, target dates, and expected benefits, is also included.

Goal 1. Implement UIC Geospatial database

The first goal of the project is to design and implement a geodatabase, within the ESRI Spatial Database Engine (ArcSDE) enterprise environment, into which the existing UIC data, currently stored in a Sybase database, can be migrated. The geodatabase structure will be based on the relational database schema currently under development by the EPA Office of Ground Water and Drinking Water (OGWDW) for the national-level UIC database and will be implemented within a geospatial environment. Extensive domain restrictions will be constructed within the geodatabase in order to ensure validity and integrity of database elements. AGRC currently maintains the Utah SGID, consisting of over 200 vector and raster imagery data layers, utilizing ArcSDE and Microsoft SQL database technology. The UIC geodatabase will be constructed within the existing SGID with editing and viewing privileges assigned according to UIC program needs. UIC staff will maintain the UIC geodatabase utilizing multi-user, remote editing, and disconnected editing capabilities provided in the ArcGIS/SDE environment. The UIC geodatabase will be connected to the Utah DEQ Exchange Network Node and a translation schema will be employed to enable XML-based responses to data requests and queries. Additionally, the entire UIC geodatabase structure, data dictionary (including spatial precision, coded value and range domains, non-nullable fields, etc.) will be exported into an XML format that can be shared with other UIC programs interested in employing a geodatabase approach.

Goal 2. Migration of Existing UIC Data

The UIC program's existing data housed in an existing Sybase database, will be imported into the new UIC geodatabase after the development of a automation plan for this migration effort. AGRC will coordinate with DEQ/IT to acquire the existing data in an open, structured format. AGRC programmers will work with UIC staff to design and implement the conversion strategy and process that includes a quality control regimen. Since the data migration effort will include populating new data elements that do not currently exist in the Sybase database and modifying existing elements to achieve agreement with the new UIC data dictionary standards, care will be taken to preserve existing information resources while modifying their form and, in some cases, supplementing existing content.

Goal 3. Integration of UIC-related Geospatial Data

In order for the UIC program to meet both its statutory requirements and to operate at the desired level of efficiency and effectiveness, geospatial data for environmental and other framework data layers must be accessible for query, analysis, and display. While most of these geospatial datasets have already been created and are being administered by a variety of stewarding agencies, this data is not offered in a highly accessible environment that would be conducive to integrated geospatial analyses. Another key environmental dataset, SWPZs, exists primarily in the form of paper maps in filing cabinets. The efforts to meet this goal will focus on improving access to and completing (in the case of SWPZs) important geospatial datasets for use by the UIC Program and other parties.

Figure 1, included in the application package, depicts the geospatial datasets that are integral to the operation of the UIC program and a plan for integrating these datasets in a common geospatial environment. With regard to existing geospatial data, AGRC will enter into hosting agreements with the various DEQ agencies to include and keep current copies of relevant environmental datasets within the SGID. Access and authentication security measures for sensitive datasets will be included in these agreements. Initially, datasets will be transferred and loaded into the SGID SDE/SQL database server. In an effort to maximize the currency of these datasets and the efficiency of the maintenance process, AGRC will develop maintenance plans and scheduled processes with each agency with a goal of achieving nightly updates to the SGID database server. As these agencies make their datasets available to the DEQ Exchange Network node, the data updates will be harvested from the agencies utilizing scheduled tasks that request and analyze information via XML exchanges through the DEQ node. To demonstrate the efficacy of this approach, Utah RCRAInfo data will be harvested from the National node and stored within the Utah SGID. This agency-to-agency XML data exchange will provide for a central, highly current, geospatial data clearinghouse that will greatly aid integrated geospatial analyses by UIC and other agencies, for meeting compliance and business needs.

The primary agency from which UIC would like to access data is the SWP Program. The UIC Program and the SWP Program have a national mandate to coordinate their efforts to protect drinking water sources. In response to this mandate, we propose to assist the SWP Program in the completion of their groundwater-based source water protection zones database. This has been begun but an estimated 80% (1,450) of the SWPZs have yet to be digitized due to lack of funding. Once this dataset has been completed, it will be stored in a secure area of the SGID. AGRC will assist DDW in preparations for connecting this dataset to the DEQ Exchange Network Node and AGRC will establish the translation component necessary to comply with the Exchange Network XML standards for the SWP Program. During the development of the SWPZ geospatial dataset, the SDWIS well locations will be examined for positional accuracy with any location errors brought to the attention of the Utah SDWIS program manager.

In addition to benefiting DEQ programs, geospatially defining the SWP zones will contribute significantly to the ability of DEQ to coordinate with the Utah Division of Homeland Security and Emergency Management in protecting this critical infrastructure component.

Goal 4. UIC Mobile Data Collection System

This project also involves acquisition of a 'toughbook' tablet-style personal computer with built-in GPS and differential correction capabilities for field-based data collection, spatial and attribute validation, & verification of UIC program data. In addition, a custom, GIS-based application will be developed to include disconnected editing capabilities, UIC data entry forms, XML data transfer utilities, automated update of integral environmental and other framework GIS background data layers, and automated map production. The tablet PC and customized GIS environment will allow for paperless data transfer of field data collections to the SDE enterprise geodatabase and for the use of extensive reference data

such as aerial photography and scanned maps, thereby enhancing data quality and data management efficiency.

Goal 5. Connect UIC Geospatial Layers to DEQ Exchange Network Node

This project will demonstrate the capability of enterprise geospatial database technology and its ability to participate in the National Environmental Information Exchange Network. An attribute mapping will be developed between the UIC Program database schema and the national XML standards under development by the National UIC program for the Exchange Network. Subsequently, the UIC program data, stored within the SGID SQL/SDE database will be connected to the DEQ node. Once the UIC program database is connected, a similar approach will be implemented to prepare for the future connection of the secure SWPZ data that will be stored as a protected GIS dataset within SDE/SQL database, to the DEQ node.

Goal 6. UIC Program Web-Based Applications

Three internet-based applications will be developed for the UIC program. The first will be a detailed data entry form that allows users to provide UIC facility data to the UIC program. When completed the user will be able to preview/correct the information provided and either approve for submission to the UIC Delta Submission table or convert and view the information in a raw XML format. User submissions will be stored temporarily in the UIC delta submission table within the SGID SDE\SQL database where they will await UIC program staff approval before being added to the UIC geospatial database. The second and related web-based application will enable users to paste and submit raw XML onto a form for verification and inclusion in the UIC delta submission table. This application will make for easier bulk submissions by those facilities with multiple underground injection. A servlet application will be developed to receive requests, assess, store, and respond to all web-based submissions. In both of these applications, access to the submission functionality will be granted to authorized users only upon completion of valid form elements.

Lastly, an ArcIMS-based, internet mapping service application will be developed to provide developers, planners, agencies, and other interested parties access to UIC program and related GIS data through an interactive map requiring only an internet connection and browser. This application will include map display, spatial query, pan/zoom, find address, and buffering/proximity tools for interactive map users. The UIC IMS application will be hosted on AGRC's redundant ArcIMS architecture, housed under a Layer 4 switch, at no cost to the project.

Goal 7. Automated UIC Report Generation

A custom Visual Basic script will be developed within the ArcGIS COM environment to calculate UIC program summary report statistics and to populate standard reporting forms in MS Excel file format. The UIC geospatial database design will take into consideration the reporting requirements for the UIC Program and additional data elements will be added to facilitate automated reporting, if necessary.

Goal 8. Project Documentation and Publication

Each procedure developed during the course of the project will be documented with step-by-step details describing the performance of each procedure. This documentation will be tested

with DWQ staff and revised, if necessary, to remove ambiguity and/or confusion in carrying out each procedure. These documents will continue to be re-evaluated and improved upon.

Finally, at the end of this project, the accomplishments and challenges will be published on the EIEN website to assist others in the development of similar projects.

3. Node Development

In the January 7, 2005 edition of the Environmental Information Exchange Network newsletter, Network Update, the State of Utah Department of Environmental Quality is recognized as having a fully operational Exchange Network Node.

4. Integrated Project Team Participation

This proposal does not include participation in an Integrated Project Team.

5. Quality Assurance

Coupled with coordination/cooperation amongst the various entities, adherence to established quality assurance protocols will ensure the creation of a high quality product. EPA has indicated its commitment to the geospatial approach to environmental program data management and decision-making in the document entitled *EPA Geospatial Blueprint: A Strategic Plan for EPA's Geospatial Program* dated June 2003. This project proposes to model the intent of that document in the development of the proposed geospatial application. Furthermore, EPA has prepared the document entitled *Guidance for Geospatial Data Quality Assurance Project Plans* dated March 2003. This document addresses the application of quality assurance measures throughout the development of a geospatial project from planning through data generation and acquisition, project assessment, and data validation. This document will be employed to ensure alignment with EPA's quality assurance expectations. This is important since the UIC data acquired will be submitted ultimately to the National UIC database.

Given the cooperative, interagency nature of the project, it is especially important to take steps to ensure cooperation and full understanding of the project plan. This will be achieved through the development of memoranda of understanding (MOU) that detail expectations, commitments, benefits, resources, and timelines with respect to this project. An initial MOU signed by agencies affected by the scope of project is included in the proposal submission. Quality assurance will be furthered using a lifecycle business planning approach that will specifically address these phases for each goal: planning, design/development, implementation, testing, operation & maintenance, assessment.

With regard to geospatial data, several components will be employed to ensure quality outcomes. First, AGRC and the UIC Program will coordinate with national efforts that are finalizing a UIC database structure, data dictionary, and an XML data transfer standard. The UIC geodatabase will employ range and coded value attribute domains developed directly from the National UIC standards efforts. These domain rules will also be employed in the remote data submission applications proposed as part of this project. AGRC will also closely monitor and, where possible, work to employ SWP standards in finishing the SWPZ database. Use of these standards will help ensure a highly usable product and an efficient

project schedule. Much work has been done in these areas and the project intends to capitalize on this work.

AGRC and its staff have extensive experience in creating, maintaining, analyzing and documenting digital geographic databases. This expertise includes working with Federal geospatial standards and the development of Federal Geographic Data Committee (FGDC) compliant metadata. AGRC believes strongly in the importance of geographic metadata and will work with the project data partners to write comprehensive metadata for all data created and shared within the project. As the steward of the Utah SGID, the state's GIS database, AGRC has direct access to high accuracy reference layers (NGA 1 foot color imagery, DOQs, NAIP 1 meter imagery, NHD water courses, GPS quality transportation data, etc.) for use in data creation and spatial validation. All data created from paper source maps (i.e. SWPZs) will be held to RMS georeferencing standards established by DEQ. Lastly, AGRC will house the geospatial data sources within a SDE/SQL database that is tasked with incremental nightly and weekly full backups.

6. Project Budget
A detailed budget for the project is included as part of the application package.

7. Project's Relationship to Other Exchange Network Activities
This project will utilize database schemas, data dictionaries, and XML standards developed for UIC and SWP as part of the Exchange Network initiatives. Data flows will be implemented through the Utah DEQ node from DEQ databases and the National RCRAInfo database into the Utah SGID geospatial database. The UIC Program geospatial database stored on the Utah SGID database server will be connected to the DEQ Exchange network node. XML translations will also be developed for the SWP program enabling this program's geospatial data to be connected to the DEQ node when the database is deemed production ready.

Table 1. Project Goals, Tasks, Schedule, & Benefits

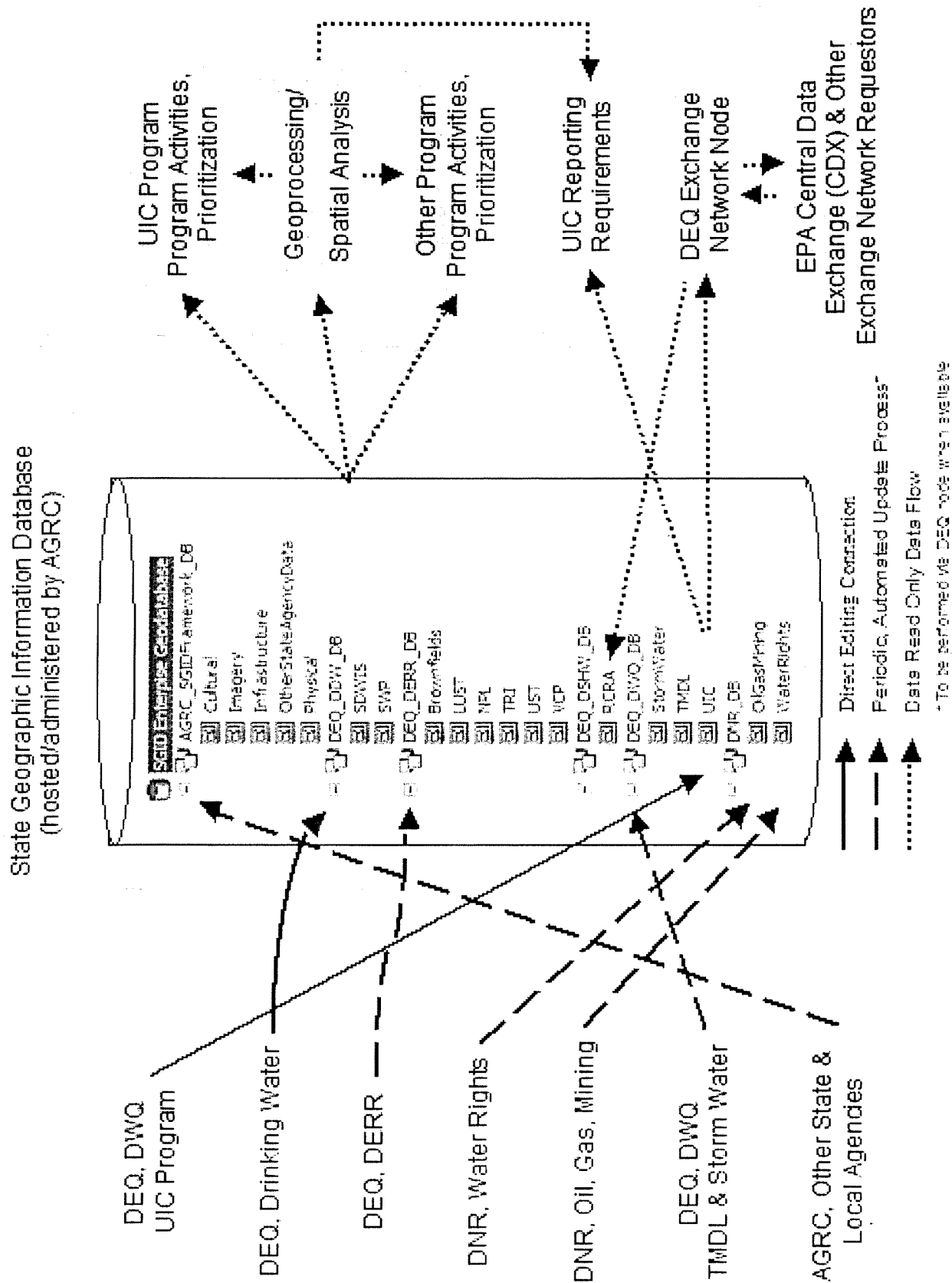| Project Goal	Tasks & Target Date*	Expected Benefits
1. Design & Implement UIC geodatabase	ESRI Adv. Geodatabase Design for UIC staff (QTR 1)	Enhance utility of UIC database by using an ArcGIS environment; move to non-proprietary, supported, & flexible database structure & software; increase access & usability of UIC data for other agencies needing to integrate this information into their analyses;
	Develop UIC Database Schema (QTR 1)	
	Design & Implement UIC Database (QTR 1)	
	Administer users, roles, privileges, versioning (QTR 1)	
2. Migrate current Sybase data into new geodatabase	Automated data migration assessment & programming (QTR 2)	Efficient transfer of existing data from legacy database to SDE enterprise database and new UIC database schema
	UIC Database additions & enhancements (QTR 2)	
	FGDC compliant metadata completed (QTR 2)	
3. Integration of UIC-related Geospatial Data	Acquire DDW data & develop update process - Digitize remaining SWPZs (QTR 4)	Prioritize UIC Program activities with regards to other UIC-related environmental program activities in order to ensure effective administration of the UIC Program in terms of public health protection. Automate update processes to maximize data currency and minimize effort needed to maintain data currency.
	Acquire DDW data & develop update process – SDWIS State data for public drinking water wells (QTR 3)	
	Acquire DSHW data & develop update process - RCRAInfo national database, inspections database, etc. (QTR 3)	
	Acquire DERR data & develop update process - NPL, VCP, TRI, Site Remediations, LUST, UST (QTR 3)	
	Acquire DOGM data & develop update process – Oil & Gas, Class II injection wells (QTR 2)	
	Acquire DWRights data & develop update process – water wells (QTR 4)	

Utah UIC Program Geospatial Data Integration Project

Project Goal	Tasks & Target Date*	Expected Benefits
4. Customized Disconnected Editing/Data Upload for UIC TabletPC w/GPS	Develop Tablet PC application for field acquisition and storage of UIC data within the geodatabase on Tablet PC w/ GPS (QTR 6)	Paperless transfer of UIC field data to database eliminating data backlog; improving data quality (complete data sets, accurate positional data)
5. Connect UIC SDE Maintained Layers to DEQ Node	Develop UIC geospatial database to National UIC XML translation schema (QTR 4)	Live UIC program data available in response to national exchange network partner requests via DEQ Node data. Prepare SWP data to be ready for connection to the Exchange Network as soon as the SWP program is ready to do so. Demonstrate ability of geospatial databases to integrate into the Exchange Network.
	Establish, test, & maintain connection at DEQ Node to SGID-based UIC data (QTR 5)	
	Develop SWP geospatial database to National SWP XML translation schema (QTR 7)	
	Establish & test connection at DEQ Node to SGID-based SWP data. (SWP program responsible for maintaining connection) (QTR 8)	
6. UIC Web-Based Applications	Develop detailed inventory information form with data validation, pick lists, required fields, etc. (QTR 6)	Paperless transfer of UIC inventory information to database eliminating data backlog; improving data quality (complete data sets, accurate data); Assist regulated community
	Develop XML Web-based application for submittal of inventory information modeled after forms above. (QTR 6)	
	Develop Servlet application for receiving submissions (QTR 7)	
7. Automated UIC Report Generation	Develop Visual Basic script for UIC statistical analysis & reporting according to National UIC requirements (QTR 8)	Reduce EPA reporting burden; increase accuracy of reporting
8. Project Documentation and Publication	Document each task (QTR 8)	Ensure consistency in the use of the end product(s); facilitate continuity of UIC program; facilitate the development of similar projects with other Exchange Network partners.
	Publish project accomplishments & lessons learned on EIEN webpage (ongoing, no later than QTR 8)	

* all deadlines are end of the stated quarter.

Figure 1.

UIC and Related Geospatial Data Editing, Update and Flow

Figure 1. UIC and Related Geospatial Data Editing, Update and Flow

State Geographic Information Database
(hosted/administered by AGRC)

- SGID Enterprise Geodatabase
  - AGRC_SGIDFramework_DB
    - Cultural
    - Imagery
    - Infrastructure
    - OtherStateAgencyData
    - Physical
  - DEQ_DDW_DB
    - SDWIS
    - SVP
  - DEQ_DERR_DB
    - Brownfields
    - LUST
    - NPL
    - TRI
    - UST
    - VCP
  - DEQ_DSHW_DB
    - RCRA
  - DEQ_DWQ_DB
    - StormWater
    - TMDL
    - UIC
  - DNR_DB
    - OilGasMining
    - WaterRights

UIC Program
Program Activities,
Prioritization

Geoprocessing/
Spatial Analysis

Other Program
Program Activities,
Prioritization

UIC Reporting
Requirements

DEQ Exchange
Network Node

EPA Central Data
Exchange (CDX) & Other
Exchange Network Requestors

DEQ, DWQ
UIC Program

DEQ, Drinking Water

DEQ, DERR

DNR, Water Rights

DNR, Oil, Gas, Mining

DEQ, DWQ
TMDL & Storm Water

AGRC, Other State &
Local Agencies

Direct Editing Connection

Periodic, Automated Update Process*

Data Read Only Data Flow

*To be performed via DEQ node when available

Memorandum of Understanding (MOU)

Memorandum of Understanding
Between
State of Utah, Department of Environmental Quality: Office of Information Technology and the
Divisions of Water Quality, Drinking Water, Environmental Response and Remediation, Solid
and Hazardous Waste
and
State of Utah, Department of Administrative Services, Automated Geographic Resource Center

The purpose of this Memorandum of Understanding (MOU) is to detail and confirm the cooperative relationship between the Office of Information Technology (OIT), Division of Water Quality (DWQ), Division of Drinking Water (DDW), Division of Environmental Response and Remediation (DERR), Division of Solid and Hazardous Waste (DSHW), and the Automated Geographic Resource Center (AGRC) in the event AGRC is awarded the FY2005 Environmental Information Exchange Network Implementation Category grant to develop an ArcGIS geodatabase and associated ArcGIS application for the Underground Injection Control (UIC) Program.

Whereas AGRC has the technical expertise and infrastructure to develop geospatial applications in the ArcGIS environment and to provide ongoing technical support and training during and after the project is completed.

Whereas DWQ administers the UIC Program which needs to update its database and to integrate UIC data with other data from other environmental and non-environmental agencies.

Whereas DDW administers the Source Water Protection (SWP) Program and the SDWIS State database. The SWP Program maintains source water protection zones in hard copy and digital format, and needs to digitize the remaining groundwater-based source water protection zones.

Whereas the UIC and SWP Programs have a national mandate to coordinate their program's activities for the protection of drinking water sources.

Whereas DERR maintains data concerning LUST, UST, Voluntary Cleanup Program (VCP) Sites, Remediation Sites, etc., sites where there is a probability that high priority injection wells may exist and where injection wells may be used in the remediation process.

Whereas DSHW maintains data concerning sites where there is a probability that high priority injection wells may exist and where injection wells may be used in the remediation process.

Whereas OIT has developed and maintains the Environmental Information Exchange Network Node for the State of Utah where data flow from the RCRAInfo, SDWIS, and the developing SWP national data systems will occur. Eventually data flow from the Utah UIC database will occur through this Node to the developing national UIC database.

Each of the undersigned parties, in the spirit of cooperation for the enhanced management of the represented environmental programs regarding UIC-regulated facilities, agrees to the following:

AGRC agrees to:
1. Develop a geodatabase for the UIC Program.
2. Develop a Tablet PC application for database data acquisition in the field.
3. Develop a web tool for acquiring UIC inventory information electronically.

4. Deliver to the UIC Program a workstation loaded with ArcEditor 9.0.

5. Deliver another license of ArcEditor 9.0 to the DWQ GIS Specialist.

6. Deliver to the UIC Program a Tablet PC loaded with ArcEditor 9.0.

7. Digitize groundwater-based source water protection zones from DDW/SWP Program giving priority to the populated regions of Utah beginning with the Wasatch Front.

8. Integrate geospatial data from participating agencies.

9. Create and host an ArcIMS Interactive Map Service to allow for visual display and query of UIC program data through a web browser.

10. Create a mapping between the UIC program geodatabase and the UIC XML standards for the Environmental Information Exchange Network and implement a connection of this database to the DEQ hosted Node.

11. Provide ongoing training and technical support to the DWQ GIS Specialist and UIC Coordinator.

12. Honor security and distribution restriction requirements for data acquired from participating agencies; in particular the SWP Program and DDW's security requirements for source water protection zone data.

OIT agrees to:

1. Work with AGRC when the project requires data flow through the EIEN Node.

DWQ/UIC Program agrees to:

1. Communicate the UIC Program data element requirements to AGRC during development of the geodatabase.

2. Communicate with AGRC during the development of the web tool for acquiring UIC inventory information electronically.

3. Communicate with other environmental programs for the acquisition of other various data layers.

4. If requested, make available to any participating environmental program any UIC data layer produced under this project.

5. Honor security and distribution restriction requirements for data acquired from participating agencies; in particular the SWP Program and DDW's security requirements for source water protection zone data.

DDW/SWP Program agrees to:

1. Communicate with the UIC Program and AGRC regarding prioritizing the digitization of the remaining groundwater-based source water protection zones.
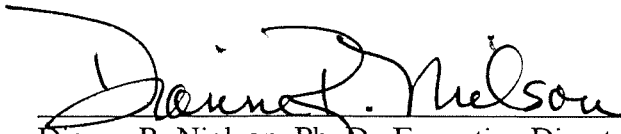
2. Provide hard-copy maps of the groundwater-based source water protection zones, and communicate with AGRC regarding the digitization criteria for the groundwater-based source water protection zones.

3. Communicate with the UIC Program and AGRC regarding the security concerns related to the groundwater-based source water protection zones.
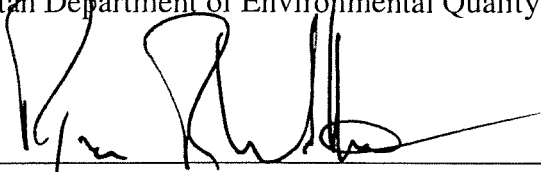
DERR agrees to:

1. Provide information regarding sites and facilities where there is a probability that high priority injection wells may exist and where injection wells may be used in the remediation process.
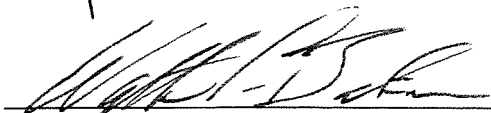
DSHW agrees to:

1. Provide information, over and above what is available from the national RCRAInfo data system, regarding sites and facilities where there is a probability that high priority injection wells may exist and where injection wells may be used in the remediation process.

Date: 1-11-05

Dianne R. Nielson, Ph. D., Executive Director
Utah Department of Environmental Quality

Date: 1-10-05

Ryan Walker, Director
Office of Information Technology
Utah Department of Environmental Quality

Date: 1-10-05

Walter L. Baker, P.E., Acting Director
Division of Water Quality
Utah Department of Environmental Quality

Date: 1-7-05

Kevin W. Brown, Director
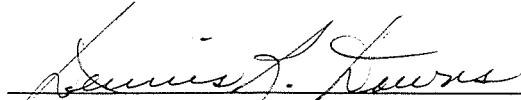Division of Drinking Water
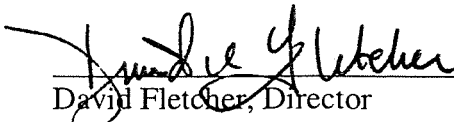Utah Department of Environmental Quality

Date: 1/10/2005

Brad Johnson, Director
Division of Environmental Response and Remediation
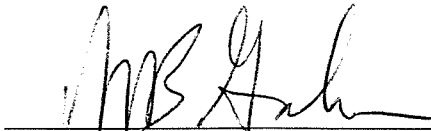Utah Department of Environmental Quality

Date: Jan. 7, 2005

Dennis Downs, Director
Division of Solid and Hazardous Waste
Utah Department of Environmental Quality

Date: 10 Jan 2005

David Fletcher, Director
Information Technology Services
Utah Department of Administrative Services

Date: 1/13/2005

Dennis Goreham, Manager
Automated Geographic Reference Center
Information Technology Services
Utah Department of Administrative Services

Detailed Itemized Budget

Detailed Itemized Budget for the Utah Underground Injection Control (UIC) Program
Geospatial Data Integration Project

	UNIT	QTY	CATEGORY TOTAL
Goal 1. Implement UIC Geospatial database			
Database design, logical and physical design	hours*	120 Pers/Frng	$7,200
Training (2 seats, Advanced Building Geodatabase, DEQ staff)	seats	2 Contractual	$2,550
Travel expenses to geodatabase training	persons	2 Travel	$1,600**
Database administration, user privileges	hours*	20 Pers/Frng	$1,200
Goal 2. Migration of Existing UIC Data			
Migration programming	hours*	100 Pers/Frng	$6,000
Data additions/enhancements	hours*	140 Pers/Frng	$8,400
Metadata	hours*	40 Pers/Frng	$2,400
Goal 3. Integration of UIC-related Geospatial Data			
Initial geospatial conversion & load	hours*	350 Pers/Frng	$21,000
Database administration, user privileges	hours*	40 Pers/Frng	$2,400
Metadata	hours*	100 Pers/Frng	$6,000
Application: Update datasets via database connections	hours*	280 Pers/Frng	$16,800
Application: Update Data to SGID via DEQ Node	hours*	240 Pers/Frng	$14,400
SWPZ Digitization (1450 SWPZ's @ 35 min/SWPZ)	hours*	845 Pers/Frng	$50,700
SWPZ Security Provisions	hours*	40 Pers/Frng	$2,400
SWPZ Metadata	hours*	40 Pers/Frng	$2,400
Goal 4. Customized Disconnected Editing/Data Upload for UIC TabletPC	hours*	300 Pers/Frng	$18,000
Goal 5. Connect DEQ SGID Maintained Layers to DEQ Node			
Connect UIC to Node & XML translation schema	hours*	150 Pers/Frng	$9,000
Connect SWP to Node & XML translation schema	hours*	80 Pers/Frng	$4,800
Goal 6. UIC Web-Based Applications			
UIC Website, Data Entry Form	hours*	280 Pers/Frng	$16,800
UIC Website, XML Submission Application & Delta DB Table	hours*	380 Pers/Frng	$22,800
Internet Mapping Service for UIC program	hours*	200 Pers/Frng	$12,000
Goal 7. Automated UIC Report Generation	hours*	60 Pers/Frng	$3,600
Goal 8. Document Project and Project Accomplishments	hours*	100 Pers/Frng	$6,000

Other Expenses

IMS and Website Hosting				$0***
SDE/SQL Database Hosting				$0***
Implementation planning & coordination	200	Pers/Frng	hours*	$12,000
Project Management & Reporting	240	Pers/Frng	hours*	$14,400
Tablet/Notebook PC with GPS	1	Supplies		$3,300
Desktop PC Workstation for UIC Program	1	Supplies		$2,500
ESRI ArcGIS ArcEditor License, Year 1 (2@$6300)	2	Contractual	license	$12,600
ESRI ArcGIS ArcEditor Secondary Maintenance, Year 2 (2@$1400)	2	Contractual	maint	$2,800
UIC Program Manager Coordination Salary		Personnel	FTE/yr	$9,970
UIC Program Manager Coordination Fringe/Benefits		Fringe	benefits	$3,980
			TOTAL	$300,000

Totals By Budget Category

Personnel*	$183,770
Fringe*	$90,880
Supplies	$5,800
Contractual	$17,950
Travel	$1,600
TOTAL	$300,000

* AGRC standard project hour rate is $60 ($40 per hour salary+$20 fringe/benefits)
** Travel costs based on: $40 per diem, $100 lodging/night, $380 air transportation
*** Through legislative mandate & appropriation, AGRC provides these services at no charge
    to state & local government